

**BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN**

**Application of Milwaukee Water Works, Milwaukee
County, Wisconsin, for Authority to Increase Water
Rates**

3720-WR-107

REBUTTAL TESTIMONY OF ANDREW BEHM

May 14, 2010

1 **Q. State your name.**

2 A. My name is Andrew Behm.

3 **Q. Have you previously submitted direct testimony in this proceeding?**

4 A. Yes.

5 **Q. What is the purpose of your rebuttal testimony?**

6 A. The purpose of my rebuttal testimony is to address several cost of service allocation issues
7 raised by Michael Gorman in his direct testimony (PSC REF#: 130702) and to address
8 information on plant balances for distribution and transmission mains submitted by MWW
9 (PSC REF#: 130647).

10 **Q. On pages D13.10 through 12 of his direct testimony, Mr. Gorman argues you should**
11 **have allocated a portion of the costs associated with transmission mains to the max**
12 **hour cost function. Explain your rationale for the allocation in your cost of service**
13 **study.**

14 A. It is true that all sizes of mains are utilized during a period of maximum hour demand. In
15 Exhibit 12.2 (PSC REF#: 129346), in accordance with Commission staff's standard cost of
16 service model and the model used in the 2007 MWW rate case, I allocated transmission

1 mains to the base system and max day system cost functions. Although transmission mains
2 must also transport water used during the maximum hour, transmission mains are designed
3 and sized to accommodate maximum day consumption, and my allocation reflects this
4 controlling design parameter.

5 Mr. Gorman's proposed change may have a minimal effect on the cost of service
6 study and the industrial class in particular. As can be seen from Schedule 9 of Exhibit
7 12.2, the industrial class is allocated 10.47 percent of the base system cost function, 4.93
8 percent of the max day system cost function, and 4.86 percent of the max hour system cost
9 function. It is not clear exactly how Mr. Gorman proposes to allocate transmission mains,
10 but presumably something would be shifted from max day to max hour as well as
11 something from base to max hour. While there will be an observable effect from moving
12 costs from base to extra-capacity cost functions as shown by the percentage allocations
13 above, the effect of moving expenses from max day to max hour cost functions, which I
14 expect will be part of the redistribution, is negligible.

15 **Q. According to Mr. Gorman on page D13.12, you shifted the base to max day and base**
16 **to max hour system demand ratios dramatically toward base without providing data**
17 **or justification. On what basis did you make this change?**

18 A. Mr. Gorman is correct in saying I shifted these two ratios significantly in the direction of
19 base cost functions. I did this for the reasons laid out on pages D12.8 through 9 of my
20 direct testimony and based on data supplied by the utility (PSC REF#: 129690).

21 The historical average day and maximum day and hour data submitted by the
22 utility show a decided downward trend in maximum day and hour consumption since 1988
23 both in absolute terms and relative to the average day. From the 1990 MWW rate case

1 until the 2007 rate case, Commission staff used base to max day and base to max hour
2 ratios reflecting peaks from 1988. These ratios are out of date and do not accurately
3 describe current demand. In this case, I recalculated these ratios based on the average
4 peaks over the last five years.

5 This recalculation, aside from better reflecting the demands placed on the system in
6 the test year, has the additional benefit of aligning MWW with other large water utilities in
7 recent rate cases. As shown in Exhibit 12.5, Cost of Service Study Overall Allocations in
8 Recent Major Rate Cases, under Commission staff's standard model the overall allocation
9 to base cost functions generally increases as the size of the utility increases. This is
10 reasonable because in a large utility there is a larger base and more possibility of spreading
11 out peaks because of the large number of customers. Surface water utilities also generally
12 have larger allocations to base cost functions than groundwater utilities. The 2007 cost of
13 service study for MWW is unique in that it allocated a significantly smaller proportion of
14 cost to base functions than one would expect from reviewing recent rate cases for other
15 utilities. My MWW cost of service study raises the allocation to base functions to the
16 highest in the sample group, but by no means is it unreasonable given the differences
17 between MWW and the other utilities.

18 Lastly, I expect the allocation to the base cost functions will decrease somewhat
19 due to information provided by MWW concerning transmission and distribution plant
20 balances. I will address this further below.

21 **Q. On pages D13.13 through 14, Mr. Gorman states you failed to consider the role of**
22 **max day and max hour demand for water in driving electricity costs. Do you agree**
23 **with Mr. Gorman?**

1 A. On page 54 of *Principles of Water Rates, Fees, and Charges: Manual of Water Supply*
2 *Practices, MI*, the AWWA agrees with Mr. Gorman that electricity costs should be
3 allocated to extra-capacity cost functions to the extent that these costs are driven by peak
4 water consumption. Leaving aside for a moment questions of whether the analysis is
5 practical, his suggestion may be an improvement to the cost of service study.

6 MWW is different from all or most other water utilities in Wisconsin because it is
7 not able to provide maximum hour consumption entirely out of elevated storage. Elevated
8 storage introduces a disconnect between the time and duration of maximum water
9 consumption by customers and the time and duration of electricity use by the utility to
10 pump and treat the water. Because Milwaukee cannot meet maximum hour demand from
11 storage, pumping must serve a max hour purpose. If this pumping for max hour causes
12 peak demand for electricity and therefore increases electricity costs, it may be reasonable
13 to allocate a portion of electricity costs related to pumping to extra-capacity cost functions.

14 In practice, the effect of this change may not be large enough to warrant the
15 complexity it adds to the cost of service analysis. It will add complexity because the
16 analysis requires at least data on max day or max hour water sales and the coincident
17 electricity use for pumping into distribution. If available, this data could be analyzed to
18 determine to what degree peak water consumption is driving electricity demand costs. The
19 effect may be minimal because a significant amount of the electricity that MWW
20 consumes is needed for its treatment process, including generation of ozone for
21 disinfection. Electricity used for this purpose is a base cost and is unaffected by Mr.
22 Gorman's proposed change.

1 **Q. On pages D13.14 through 16, Mr. Gorman maintains you inappropriately allocated**
2 **distribution costs to large industrial customers by failing to differentiate between**
3 **large and small diameter distribution main. What is the basis for your allocation of**
4 **distribution costs?**

5 A. Mr. Gorman correctly points out that I allocate all sizes of distribution mains to all
6 customers, even though the benefit to specific customers from certain sizes of mains is
7 dubitable. I did this in accordance with Commission staff's standard cost of service model
8 and the model used in the 2007 MWW rate case.

9 I also question the statement that MillerCoors receives no benefit from small
10 diameter distribution main. MWW has an insignificant quantity of 2 and 4 inch main
11 (combined 55,923 feet compared to 2,715,069 feet of 6 inch main in the 2009 Annual
12 Report), so allocation of this very small diameter main is not an issue. While 6 inch main
13 alone may not be able to fully supply MillerCoors, a grid of 6 inch main reinforcing a
14 network of larger mains provides system redundancy and can serve as a stopgap in case of
15 the failure of a larger main. While this main may not primarily benefit MillerCoors, it does
16 benefit that company to a degree sufficient to justify MillerCoors' participation in the cost
17 of this main.

18 MillerCoors' argument applies equally well to a customer near the water treatment
19 plant that does not believe it should be required to pay for mains to serve customers
20 located farther from the plant. Commission staff's standard cost of service study model
21 bases cost of service on the characteristics of an average customer within a class, not on
22 the particular attributes of specific customers. This approach is fairer, even if some
23 customers vary from the average.

1 Mr. Gorman’s proposal also complicates the cost of service analysis. In its simplest
2 implementation, his proposal would require three more customer classes: large
3 commercial, large industrial, and large public authority. In its more refined
4 implementations, the cost of service study could include a larger number of customer
5 subclasses based on customer size and location within the distribution system and could
6 require a customized allocation of distribution mains to each subclass. Such analysis may
7 produce more refined results, but I question the value of the added refinement given the
8 added complexity.

9 **Q. On page D13.17, Mr. Gorman contends you unrealistically decreased the residential**
10 **class max hour extra-capacity ratio without justification. What is the justification for**
11 **this change?**

12 A. I reduced the max hour extra-capacity demand ratios for all retail classes compared to the
13 2007 cost of service study. Mr. Gorman is correct that no data is available from which to
14 directly calculate max hour extra-capacity demand ratios. However, my revised extra
15 capacity ratios are not “unrealistic”.

16 The urban retail max hour extra-capacity demand ratios used in the 2007 cost of
17 service study are 4.64, 4.50, 1.11, and 3.93 for residential, commercial, industrial, and
18 public authority, respectively. The cost of service study performed for MWW in 1990 in
19 docket 3720-WR-101, 17 years earlier, used virtually identical urban retail max hour extra-
20 capacity ratios of 4.64, 4.52, 1.11, and 3.93 for residential, commercial, industrial, and
21 public authority. Given the dramatic changes MWW has experienced in its customer base
22 over the last two decades, it would have been unrealistic to continue using extra-capacity
23 ratios calculated in 1990.

1 In the absence of actual demand data, I reviewed recent cost of service studies for
2 other large wholesaling utilities as described on page D12.17 of my direct testimony. In
3 every case the max hour extra-capacity ratios used for MWW were significantly higher
4 than those used for other utilities, not only taken by themselves but also in comparison
5 with the max day extra-capacity ratios. By reviewing recent Racine, Kenosha, and Oak
6 Creek rate cases, I was able to establish a reasonable relationship between max day, max
7 hour, and average consumption for each class. The ratio of max day to average day
8 consumption is equal to one plus the max day extra-capacity ratio. Likewise, the ratio of
9 max hour to average hour consumption is equal to one plus the max hour extra-capacity
10 ratio. The ratio of max hour to average hour should be greater than the ratio of max day to
11 average day by a factor of 1.51 for the residential class, 1.44 for commercial, 1.28 for
12 industrial, 1.41 for public authority, and 1.43 for wholesale. An example of this calculation
13 is given for Brown Deer in my direct testimony on page D12.17.

14 So while the max hour extra-capacity customer class ratios are not directly
15 calculated from actual MWW data, they are based on the max day extra-capacity ratios,
16 which are unchanged from the 2007 cost of service study. This lowered the max hour
17 extra-capacity ratios into a range that is more reasonable both by themselves and in
18 relation to max day extra-capacity ratios. Even though the same method for recalculating
19 extra-capacity max hour ratios was applied to all classes, it benefitted the residential class
20 the most because they had the highest max hour extra-capacity ratios in 2007.

21 Commission staff is working with MWW to implement advanced metering that
22 will allow MWW to collect actual measurements of maximum day and maximum hour
23 consumption for individual customers or customer groups. I anticipate MWW will include

1 this information in its next full rate case proceeding to allow, if necessary, recalculation of
2 customer class extra-capacity ratios at that time.

3 **Q: Discuss the information submitted by MWW relating to transmission and**
4 **distribution plant balances and how it will affect your cost of service study.**

5 A: On schedules 5 and 5a of Exhibit 12.2, I estimated plant balances for transmission and
6 distribution mains as described on pages D12.11 through 13 of my direct testimony.
7 Subsequently, MWW submitted actual original cost plant balances for transmission and
8 distribution. This additional information allows me to more accurately distribute
9 depreciation, taxes, and return on net investment rate base between transmission and
10 distribution mains. The effect is to increase the cost of service for customer classes that
11 pay distribution costs (urban and suburban retail) and to reduce the cost of service for
12 classes that drive primarily base costs (retail industrial) and classes that are excluded from
13 distribution costs (wholesale and West Milwaukee).

14 **Q: Does this conclude your rebuttal testimony?**

15 A: Yes.